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IS 6108 (1971): Edible Sesame Flour (Solvent Extracted)  
[FAD 16: Foodgrains, Starches and Ready to Eat Foods]



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IS: 6108-1971

## *Indian Standard*

### SPECIFICATION FOR EDIBLE SESAME FLOUR (SOLVENT EXTRACTED)

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**INDIAN STANDARDS INSTITUTION**  
MANAK BHAVAN, 9 RAHADUR SHAH ZAFAR MARG  
NEW DELHI 1

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# *Indian Standard*

## SPECIFICATION FOR EDIBLE SESAME FLOUR (SOLVENT EXTRACTED)

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**AMENDMENT NO. 1     MARCH 1979**  
**TO**  
**IS : 6108-1971 SPECIFICATION FOR EDIBLE**  
**SESAME FLOUR ( SOLVENT EXTRACTED )**

**Alteration**

[ *Page 5, Table 1, Sl No. (vi)* ] — Delete and renumber the subsequent items accordingly.

**Addenda**

( *Page 4, clause 2.1* ) — Add the following new clause after **2.1**:

‘**2.1.1** Edible sesame flour ( solvent extracted ) shall be free from harmful foreign oilcakes such as castor and *MAHUA* when tested according to the methods prescribed in **11** and **12** respectively of IS : 7874 ( Part I )-1975§. It shall also be free from *NEEM* cake and other foreign materials such as jaggery and molasses.’

( *Page 4, foot-note with ‘ $\ddagger$ ’ mark* ) — Add the following new foot-note after ‘ $\ddagger$ ’ mark:

‘§Methods of sampling and tests for animal feeds and feeding stuffs: Part I General methods.’

**AMENDMENT NO. 2 MAY 2004  
TO  
IS 6108 : 1971 SPECIFICATION FOR EDIBLE SESAME  
FLOUR ( SOLVENT EXTRACTED )**

[ Page 5, Table 1, col heading 5 ] — Substitute 'IS 4684 : 1975\*' for 'IS : 4684 : 1968 \*'.

[ Page 5, Table 1, Sl No. (iii), col 5 ] — Substitute 'D' for 'E'.

[ Page 5, Table 1, Sl No. (iv), col 5 ] — Substitute 'E' for 'F'.

[ Page 5, Table 1, Sl No. (v), col 5 ] — Substitute 'F' for 'G'.

[ Page 5, Table 1, Sl No. (vii), col 5 ] — Substitute 'H' for 'J'.

[ Page 5, Table 1, Sl No. (viii), col 2 ] — Substitute 'Hexane (food grade), ppm, Max' for 'Residual solvent, ppm, Max'.

[ Page 5, Table 1, Sl No. (viii), col 3 ] — Substitute '10' for '170'.

[ Page 5, Table 1, Sl No. (ix), col 5 ] — Substitute 'IS 5402 : 2002†' for 'L'.

[ Page 5, Table 1, Sl No. (x), col 5 ] — Substitute 'IS 5401 ( Part 1 ) : 2002†' for 'M'.

[ Page 5, Table 1, Sl No. (xi), col 2 ] — Substitute 'Salmonella bacteria per 25 g' for 'Salmonella bacteria'.

[ Page 5, Table 1, Sl No. (xi), col 5 ] — Substitute 'IS 5887 ( Part 3 ) : 1999§' for 'N'.

[ Page 5, Table 1, Sl No. (xii) ] — Insert the following at the end of the table:

Sl No.	Characteristic	Requirement	Method of Test, Ref to Appendix of	
			This Standard	IS 4684 : 1975*
(1)	(2)	(3)	(4)	(5)
xiii)	Aflatoxin, µg/kg, Max	30	—	J

## **Amend No. 2 to IS 6108 : 1971**

( *Page 5, Table 1, footnotes* ) — Insert the following footnotes at the end of the table:

\*Specification for edible groundnut flour ( expeller pressed ) ( *first revision* ).

†General guidance for the enumeration of micro-organisms — Colony counts technique at 30°C ( *first revision* ).

‡Microbiology — General guidance for enumeration of coliforms : Part 1 Colony count technique ( *first revision* ).

§Methods of detection of bacteria responsible for food poisoning : Part 3 General guidance on method of detection of Salmonella ( *second revision* ).

( FAD 16 )

## *Indian Standard*

### SPECIFICATION FOR EDIBLE SESAME FLOUR (SOLVENT EXTRACTED)

#### 0. FOREWORD

**0.1** This Indian Standard was adopted by the Indian Standards Institution on 5 May 1971, after the draft finalized by the Foodgrains, Foodgrain Products and Edible Oilseed Flours Sectional Committee had been approved by the Agricultural and Food Products Division Council.

**0.2** Edible oilseed flours have a very pivotal role in overcoming the widely prevalent protein mal-nutrition in the country. In addition to edible groundnut, cottonseed and soya bean flours, edible sesame flour has considerable scope for its utilization in this field. Sesame flour is rich in methionine and can be successfully used as a protein supplement both in the blended as well as in the processed foods. Therefore, in order to ensure production of edible sesame flour of the right quality this specification is being prepared.

**0.3** In the preparation of this standard, due consideration has been given to the provisions of the Solvent Extracted Oil, De-oiled Meal and Edible Flour (Control) Order, 1967; the Prevention of Food Adulteration Act, 1954 and the Rules framed thereunder. However, this standard is subject to the restrictions imposed under these, where applicable.

**0.4** With a view to enable the entrepreneurs in producing edible sesame flour (solvent extracted) of a proper quality it is recommended that the method given in Appendix A may be used.

**0.4.1** A separate Indian Standard on edible sesame flour (expeller pressed) is being issued.

**0.5** For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the results of a test or analysis, shall be rounded off in accordance with IS:2-1960\*. The number of significant places retained in the rounded off values should be the same as that of the specified values in this standard.

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\*Rules for rounding off numerical values (*revised*).

## **1. SCOPE**

**1.1** This standard prescribes the requirements and the methods of sampling and test for edible sesame flour obtained by the solvent extraction process.

**1.1.1** This standard shall apply only to edible flour obtained from white sesame seeds.

## **2. REQUIREMENTS**

**2.1 Description** — Edible sesame flour (solvent extracted) shall have been obtained by pressing cleaned, sound, healthy and decuticled sesame seeds followed by solvent extraction or by direct extraction of kernels. The material shall be in the form of flour of white to pale creamy-white colour, shall be uniform in composition and free from extraneous matter, insects, rodent hair and excreta, fungal infection, objectionable odour and rancid taste.

**NOTE** — The appearance, taste and odour shall be determined by organoleptic tests.

**2.2 Particle Size** — Unless otherwise specified by the purchaser, edible sesame flour (solvent extracted) shall be of such fineness that it passes completely through 150-micron IS Sieve (see IS:460-1962\*).

**2.3 Solvent for Extraction** — Only hexane of food grade conforming to IS:3470-1966† shall be used for extraction.

**2.4 Freedom from Artificial Colouring Matter and Flavouring Agents** — Edible sesame flour (solvent extracted) shall be free from any artificial colouring matter and flavouring agents.

**2.5** The material shall be manufactured in premises using equipment maintained under hygienic conditions necessary for food processing units (see IS:2491-1963‡).

**2.6** The material shall also conform to the requirements specified in Table 1.

## **3. PACKING AND MARKING**

**3.1 Packing** — The material shall be packed in sealed metal containers or jute/hessian bags with polyethylene lining of 40 to 75 microns.

**3.2 Marking** — The following particulars shall be marked legibly or labelled on each container:

- a) Name of the material,
- b) Name and address of the manufacturer,
- c) Batch or code number, and
- d) Net weight.

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\*Specification for test sieves (*revised*).

†Specification for hexane, food grade.

‡Code for sanitary conditions for food processing units.

**3.2.1** Each container may also be marked with the ISI Certification Mark.

**NOTE**— The use of the ISI Certification Mark is governed by the provisions of the Indian Standards Institution ( Certification Marks ) Act, and the Rules and Regulations made thereunder. Presence of this mark on products covered by an Indian Standard conveys the assurance that they have been produced to comply with the requirements of that standard, under a well-defined system of inspection, testing and quality control during production. This system, which is devised and supervised by ISI and operated by the producer, has the further safeguard that the products as actually marketed are continuously checked by ISI for conformity to the standard. Details of conditions, under which a licence for the use of the ISI Certification Mark may be granted to manufacturers or processors, may be obtained from the Indian Standards Institution.

#### 4. SAMPLING

**4.1** The method for drawing representative samples of the material and the criteria for conformity shall be as prescribed in 4 of IS: 5315-1969\*.

**TABLE 1 REQUIREMENTS FOR EDIBLE SESAME FLOUR  
( SOLVENT EXTRACTED )**

( Clause 2.6 )

SL No.	CHARACTERISTIC	REQUIREMENT	METHOD OF TEST, REF TO APPENDIX OF	
			This Standard	IS: 4684- 1968*
(1)	(2)	(3)	(4)	(5)
i)	Moisture, percent by weight, <i>Max</i>	9.0	—	B
ii)	Crude protein ( on dry basis ), per- cent by weight, <i>Min</i>	47.0	—	C
iii)	Total ash ( on dry basis ), percent by weight, <i>Max</i>	6.0	—	E
iv)	Acid-insoluble ash ( on dry basis ), percent by weight, <i>Max</i>	0.15	—	F
v)	Fat ( on dry basis ), percent by weight, <i>Max</i>	1.5	—	G
vi)	Acid value of extracted fat, <i>Max</i>	4.0	—	H
vii)	Crude fibre ( on dry basis ), per- cent by weight, <i>Max</i>	6.0	—	J
viii)	Residual solvent, ppm, <i>Max</i>	170	B	—
ix)	Total bacterial count per g, <i>Max</i>	50 000	—	L
x)	Coliform bacteria per g, <i>Max</i>	10	—	M
xi)	Salmonella bacteria	Nil	—	N
xii)	Oxalic acid content, percent by weight, <i>Max</i>	0.5	C	—

\*Specification for edible groundnut flour ( expeller pressed ).

\*Methods of sampling for milled cereals and pulses products.

## **5. TESTS**

**5.1** Tests shall be carried out in accordance with 2.1, 2.2 and appropriate appendices as specified in col 4 and 5 of Table 1.

**5.2 Quality of Reagents**— Unless specified otherwise, pure chemicals shall be employed in tests and distilled water (*see* IS: 1070-1960\*) shall be used where the use of water as a reagent is intended.

**NOTE** — 'Pure chemicals' shall mean chemicals that do not contain impurities which affect the result of analysis.

# **A P P E N D I X A**

(*Clause 0.4*)

## **METHODS OF PRODUCTION OF EDIBLE SESAME FLOUR (SOLVENT EXTRACTED)**

### **A-1. PROCEDURE**

**A-1.1** For the purpose of expelling only clean, sound, healthy seeds shall be used. Broken, damaged seeds should not be used.

**A-1.2 Preparation from Pre-pressed Sesame Oilcake**— The cleaned seeds are first decuticled (dehusked). For this purpose, the seeds may first be soaked in water or in solutions of chemicals for varying lengths of time. Soaking period would depend upon the use of wetting agents, when the time could be reduced to within 1 to 2 hours. The soaked seeds are then subjected to a process of scrubbing in a suitable equipment capable of disentangling the outer cuticles from the kernels. The mixture of cuticles and kernels is then spread on wire mesh and washed in a current or spray of water. The cuticles thus get washed away and the remaining kernels are either sundried or dried by mechanical means. These kernels after suitable adjustments for optimum moisture conditions are rolled and passed through an expeller under conditions to maintain the required protein and fat content in the cake at the specified levels. The cake is then extracted by means of a solvent and the meal is then ground in a hammer mill to the desired degree of fineness.

**A-1.3 Preparation by Extracting Sesame Seeds Directly**— Clean sesame seeds are first decuticled (**A-1.2**). After suitable adjustment of moisture the sesame kernels are subjected to solvent extraction. The extracted meal is then dried, cooled and ground in a hammer mill to the desired degree of fineness.

\*Specification for water, distilled quality (*revised*).

**APPENDIX B**[ *Table 1, Item (viii)* ]**DETERMINATION OF RESIDUAL SOLVENT****B-1. APPARATUS****B-1.1 Glass Jars** — of 5-litre capacity.**B-1.2 McLuckie Explosimeter or Equivalent****B-2. PROCEDURE**

**B-2.1** Take 250 g of the sample and quickly transfer it to the 5-litre jar fitted with a rubber bung (smeared with glycerol) having an escape tube with a screw clip attached. Ascertain the weight of the flour in the jar. Shake the flour well and lay the jar on its side to spread out the sample over as wide an area as possible. After a period of not less than 4 hours, pump some of the atmosphere in the jar into McLuckie explosimeter. Allow to stabilize for four minutes and ignite the vapour for two minutes by means of platinum wire filament connected to a 2-volt accumulator. Allow to cool for four minutes. Read off the percentage concentration ( $v/v$ ) of vapour of the solvent in air (5-litre jar, and calculate liquid equivalent of the solvent).

**B-2.2** Periodically carry out a blank using ordinary atmosphere through the instrument. Deduct this figure from the readings on the calibrated manometer scale.

**B-3. CALCULATION**

$$\text{B-3.1 Solvent, in litre per quintal} = \frac{p \times 75}{w} \times 0.447$$

where

$p$  = percentage concentration of the residue, and

$w$  = weight in g of the flour taken for the test.

**NOTE** — The factor 75 used in the calculation allows for the fact that 20 percent of the total solvent in the flour is retained by absorption and is, therefore, not registered by explosimeter.

## APPENDIX C

[Table 1, Item (xii)]

### DETERMINATION OF OXALIC ACID CONTENT

#### C-1. APPARATUS

##### C-1.1 Waring Blender

#### C-2. REAGENTS

**C-2.1 Dilute Hydrochloric Acid** — (1 + 1).

**C-2.2 Ammonium Hydroxide Solution** — sp gr 0.880.

**C-2.3 Phosphoric Tungstate Reagent** — prepared by dissolving 24 g of sodium tungstate in water. To this is then added 40 ml of syrupy phosphoric acid (sp gr 1.75) and the solution is then diluted to 1 litre.

**C-2.4 Calcium Chloride Buffer Solution** — Dissolve 25 g of anhydrous calcium chloride in 500 ml of 50 percent (*v/v*) glacial acetic acid and add this solution to a solution of 330 g of sodium acetate in water, diluted to 500 ml.

**C-2.5 Wash Solution** — A 5 percent (*v/v*) solution of acetic acid kept over calcium oxalate at room temperature. Shake the solution periodically and filter before use.

**C-2.6 Sulphuric Acid** — 10 percent (*v/v*) solution.

**C-2.7 Potassium Permanganate Solution** — 0.02 N.

#### C-3. PROCEDURE

**C-3.1** Homogenize about 6 g of the material with about 100 ml of water in the blender and transfer the mixture to a 600-ml beaker with the minimum number of washings. Add 2 volumes of dilute hydrochloric acid to each 10 volumes of liquid (to give an approximately normal concentration) and one or two drops of capryl alcohol and boil for 15 minutes. Allow to cool, transfer to a 500-ml volumetric flask, dilute to the mark and after occasional shaking set it aside overnight. Mix and filter through a dry paper. Transfer by means of a pipette, 25 ml of filtrate into a tube fitted with a stopper, add 5 ml of phosphoric tungstate reagent, mix by inverting once or twice and set the mixture aside for 5 hours. Centrifuge for 10 minutes at 3 000 rev/min and radius 150 cm,

transfer exactly 20 ml of the clear solution to a 50-ml centrifuge tube and add ammonium hydroxide dropwise from a burette until the solution is alkaline, as indicated by the formation of slight precipitate of phosphotungstate. Add 5 ml of calcium chloride reagent, stir with a fine glass rod and leave the tube overnight in a refrigerator at 5 to 7°C. Centrifuge for 10 minutes, carefully remove the supernatant liquid and wash the precipitate with 20 ml of wash solution, stirring vigorously with a fine rod until the precipitate is broken up and the impurities dissolve. Centrifuge for 10 minutes, carefully remove the washings, dissolve the precipitate in 5 ml of 10 percent sulphuric acid, place the tube in a water-bath at 100°C for 2 minutes and titrate the oxalic acid with 0.02 N potassium permanganate. Calculate oxalic acid content from the factor that 1 ml of 0.02 N potassium permanganate solution is equivalent to 0.00090 g of oxalic acid.

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